

# San José-Santa Clara Regional Wastewater Facility Capital Improvement Program



## Semiannual Status Report January-June 2013



San José-  
Santa Clara  
Regional  
Wastewater  
Facility



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*Eastward view of the secondary treatment tanks, which use bacteria to clean wastewater.*

## San José-Santa Clara Regional Wastewater Facility Capital Improvement Program Semiannual Status Report January - June 2013

# I. Introduction

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## Report Objective and Contents

This report provides information on the implementation of capital improvement projects at the San José-Santa Clara Regional Wastewater Facility\* (Facility). All projects discussed in the report are guided by the Draft Plant Master Plan (Draft PMP) and included in the 2013-2017 Adopted Capital Improvement Program (CIP). South Bay Water Recycling projects, which are not considered Facility projects, are not part of this report.

The projects discussed in the report are tracked in the Capital Project Management System (CPMS) database and fall under one of three classifications:

- **Construction Projects:** Capital improvement projects that are designed by City staff or consultants, then bid to a contractor for construction. Such projects may also be built by City staff, or by other entities through an agreement.
- **Non-Construction Projects:** Non-construction projects that may lead to the construction of capital improvements such as feasibility studies, pilot studies, and master planning efforts.
- **Public Art Projects:** The CIP also funds projects that involve public art installations; these projects may be associated with a specific capital improvement or may be part of a larger public art strategy with funding support from the CIP.

This report also describes the policy context that guides decision making; outlines accomplishments and specific issues; provides detailed summaries of project schedules and budgets; and highlights key projects in the CIP.

## Facility Background

The Facility is a regional advanced wastewater treatment plant that serves eight South Bay cities and four sanitation districts:

- City of San José
- City of Santa Clara
- City of Milpitas
- Cupertino Sanitary District (Cupertino)
- West Valley Sanitation District (Campbell, Los Gatos, Monte Sereno and Saratoga)
- County Sanitation Districts 2-3 (unincorporated)
- Burbank Sanitary District (unincorporated)

Jointly owned by the cities of San José and Santa Clara, the Facility is managed and operated by the City of San José's Environmental Services Department (ESD).

The Facility is the largest tertiary wastewater treatment plant in the western United States. Operating on a 24-hour schedule, 365 days per year, the Facility treats an average of 110 million gallons per day (mgd) of wastewater, has an average dry weather flow design capacity of 167 mgd, and peak hourly flow capacity of 271 mgd. The Facility's operational area occupies 180 acres of a 2,600-acre site at the southern edge of the San Francisco Bay.

Constructed in 1956 as a primary treatment plant for agricultural wastewater and a growing population, the Facility subsequently expanded in response to continued population and economic growth and to meet state regulations. Facilities for secondary treatment were constructed in 1964, followed by another expansion to tertiary treatment in 1979 to meet Clean Water Act regulations. Additional expansions included the South Bay Water Recycling facility in 1998, and an advanced recycled water treatment plant, currently under construction in partnership with the Santa Clara Valley Water District (SCVWD).



*Facility groundbreaking, 1956*

\* Formerly the San Jose/Santa Clara Water Pollution Control Plant

## Importance to the Region and Environment

As the South Bay has grown, so has the critical importance of the Facility to the region. The Facility ensures that the wastewater it receives is cleaned to meet strict standards to protect public health and the environment. The Facility serves more than 1.4 million residents and approximately 17,000 businesses in an area greater than 300 square miles. South Bay communities depend on it to reliably protect their quality of life as well as safeguard wildlife habitat and Bay water quality. Businesses such as food service, automotive, metal finishing, photo processing, and manufacturing rely on the Facility to ensure that their wastewater is further treated to meet regulations. In protecting residents, businesses, and the environment, the Facility supports the local economy.

The Facility recycles about 10 mgd of its highly treated wastewater annually for use in landscape irrigation, industrial processes, cooling towers, and toilet flushing in certain commercial areas of San José, Santa Clara, and Milpitas. The recycled water program saves an average of 2.2 billion gallons of drinking water each year. Advanced treatment for recycled water is currently under joint development by the Facility and SCVWD; such treatment allows for expanded uses of recycled water.

### Facility Energy Accomplishments

- **2010:** The Facility was honored with a Green California Leadership Award for its energy innovations.
- **2009:** The federal Environmental Protection Agency included the Facility in a nationwide list of the top 10 on-site alternative energy producers and users.

The Facility generates up to 75 percent of its own energy, an important contribution to local air quality and energy reliance efforts. Like other similar plants, the Facility is a large energy user. Its secondary treatment aeration process, followed by process pumping and heating, represent two major sources of demand. The Facility's daily energy demand can range from eight to 11 megawatts (MW). By using on-site power generation equipment and a blend of digester, landfill, and natural gases, the Facility can produce as much as 8 MW of power daily. The Facility has been recognized for its energy accomplishments, and is working towards accomplishing the City's Green Vision goal of 100 percent energy self-sufficiency by 2022.

### Infrastructure Condition Assessment and Draft PMP

Most of the Facility's infrastructure is now more than 50 years old and has exceeded its useful life, with repairs needed to every process area. Still, the Facility must continue to provide uninterrupted service and meet the strict requirements of more

than 18 federal, 13 state, and four regional regulations for treated wastewater discharge, use of recycled water, disposal of biosolids, air emissions, safety requirements, and land use controls. The Facility's key role as protector of public and environmental health underscores the critical need for infrastructure rehabilitation and replacement.

In 2007, the Facility completed an Infrastructure Condition Assessment report that identified nearly \$1 billion in needed projects to refurbish the Facility's aging electrical, mechanical, and structural assets. The report recommended \$250 million in immediate critical repairs to the Facility's electrical and solids digestion systems and \$750 million in other significant but lower-priority capital replacements. The report also identified a funding gap of approximately \$40 million annually, based on a recommended capital reinvestment level of \$250 million per five-year CIP cycle to address decades of deferred maintenance.

Rebuilding and improving the Facility is among the largest public works efforts in the South Bay's history.

As the assessment study focused only on existing condition deficiencies, staff recommended the development of a master plan that would address how the different treatment processes interrelate, the impacts of future regulations, changes to flow and loads, risks from rising sea level, and opportunities for implementing new technology or process optimization.

In late 2007, the San José City Council and the Treatment Plant Advisory Committee (TPAC) approved a consultant agreement to develop a Plant Master Plan. A Steering Committee comprised of staff from the cities of San José, Santa Clara, and the tributary agencies guided the three-year planning process, with extensive technical oversight and stakeholder input. The project team provided regular updates to TPAC and San José's Transportation and Environment Council Committee (T&E). This work resulted in the Draft Plant Master Plan (Draft PMP) Preferred Alternative, approved by TPAC and the City Council in April 2011.

## CURRENT FACILITY OPERATIONAL AREA



*Existing Facility and residual solids management areas*

### Draft PMP Update

Master Plan activities completed for this reporting period include circulation of the Draft Environmental Impact Report (DEIR) for public review from January 2013 through March 2013. Staff generated an amended EIR with comments received from members of the public and other agencies.

Staff estimates that the amended EIR will be available for public review in October 2013. The San José Planning Commission's public hearing to certify the EIR is targeted for October 2013. Subsequent to EIR certification, the Planning Commission and Council will consider formal adoption of the Plant Master Plan in November 2013. As co-owner, the Santa Clara City Council will also consider approval of the Plant Master Plan, prior to the San José City Council's final action.

## II. Program Overview

The Draft PMP envisions approximately \$2 billion in investments over the next 30 years to rebuild and modernize the Facility. More than 100 capital improvement projects are recommended, with the most critical rehabilitation work scheduled over the first 15 years.

**Project Criteria.** Capital projects recommended by the Draft PMP were evaluated and prioritized based on six criteria:

1. **Infrastructure condition:** Risk of failure requires repairs or rehabilitation
2. **Regulatory requirements:** Future regulations require new or modified infrastructure
3. **Economic benefit:** Opportunities exist to save operations and maintenance costs by modifying or replacing infrastructure
4. **Improved performance benefit:** Modifying or replacing existing infrastructure improves reliability or treatment performance
5. **Increased flows or increased loading:** Increased flows trigger the need for additional infrastructure
6. **Policy decision:** Policy direction triggers improvements

### Recommended Projects

**Table 1 — Summary of Recommended Capital Improvements** summarizes all recommended projects by process area over a 30-year planning period. A detailed list of projects in each process area is located on page 35. Thirty-six projects have been incorporated into the CIP budget, which provides \$339.2 million in funding, \$144.3 million of which is allocated in Fiscal Year (FY) 2012-2013. Highlights of selected capital projects begin on page 21.

Table 1 — Summary of Recommended Capital Improvements		
Process Area	Adopted FY 2013-2017	Draft PMP Cost Estimate*
1. Preliminary Treatment Projects	\$13.4 M	\$151.2 M
2. Primary Treatment Projects	\$33.2 M	\$150.4 M
3. Secondary Treatment Projects	\$35.9 M	\$240.0 M
4. Tertiary Treatment Projects	\$2.8 M	\$201.0 M
5. Biosolids Digestion	\$64.6 M	\$156.3 M
6. Biosolids Residual Sludge Management	\$1.6 M	\$362.3 M
7. Power Generation	\$4.6 M	\$166.2 M
8. Electrical Systems	\$3.0 M	\$32.6 M
9. Advanced Process Control and Automation Systems	\$6.5 M	\$9.8 M
10. Site Facility Improvements	\$32.3 M	\$599.5 M

*\*Cost estimates follow the American Associate of Cost Engineering International (AACE International) Recommended Practice No. 18R-97 estimate classes 5 and 4. Typical accuracy range for Class 5 estimates are -20 percent to -50 percent on the low side, and +30 percent to +100 percent on the high side. Class 4 estimates are -15 percent to -30 percent on the low side, and +20 percent to +50 percent on the high side. Cost estimates for engineering, construction, and contingencies are escalated to the midpoint construction at 2 percent per annum.*

## Program Management Strategy

ESD staff developed a program management strategy to facilitate implementation of the ambitious program recommended in the Draft PMP. The CIP incorporates this strategy, which utilizes outside consultants and technical experts to:

- Develop alternative implementation strategies;
- Address construction sequencing for uninterrupted Facility operations; and
- Provide additional expertise in light of current staff vacancies at the Facility.

Elements of the program management strategy include:

- Partnering with the City's Public Works Department to optimize capital project delivery;
- Hiring expert consultants to advise and assist with program management, technical direction and coordination, design and design/build procurements; and
- Implementing a phased approach that organizes Draft PMP projects into three separate "packages." The package approach is designed to minimize disruptions to Facility operations, lower the risk of permit violations, meet the Facility's good neighbor goals, and manage rate impacts.

A program management team comprised of City staff and outside consultants will be located at the Facility to most effectively manage the program, share knowledge, and coordinate with Facility staff. This integrated team will provide program support, including design and construction management, cost estimating, scheduling, document control, change management, budgeting, and reporting.

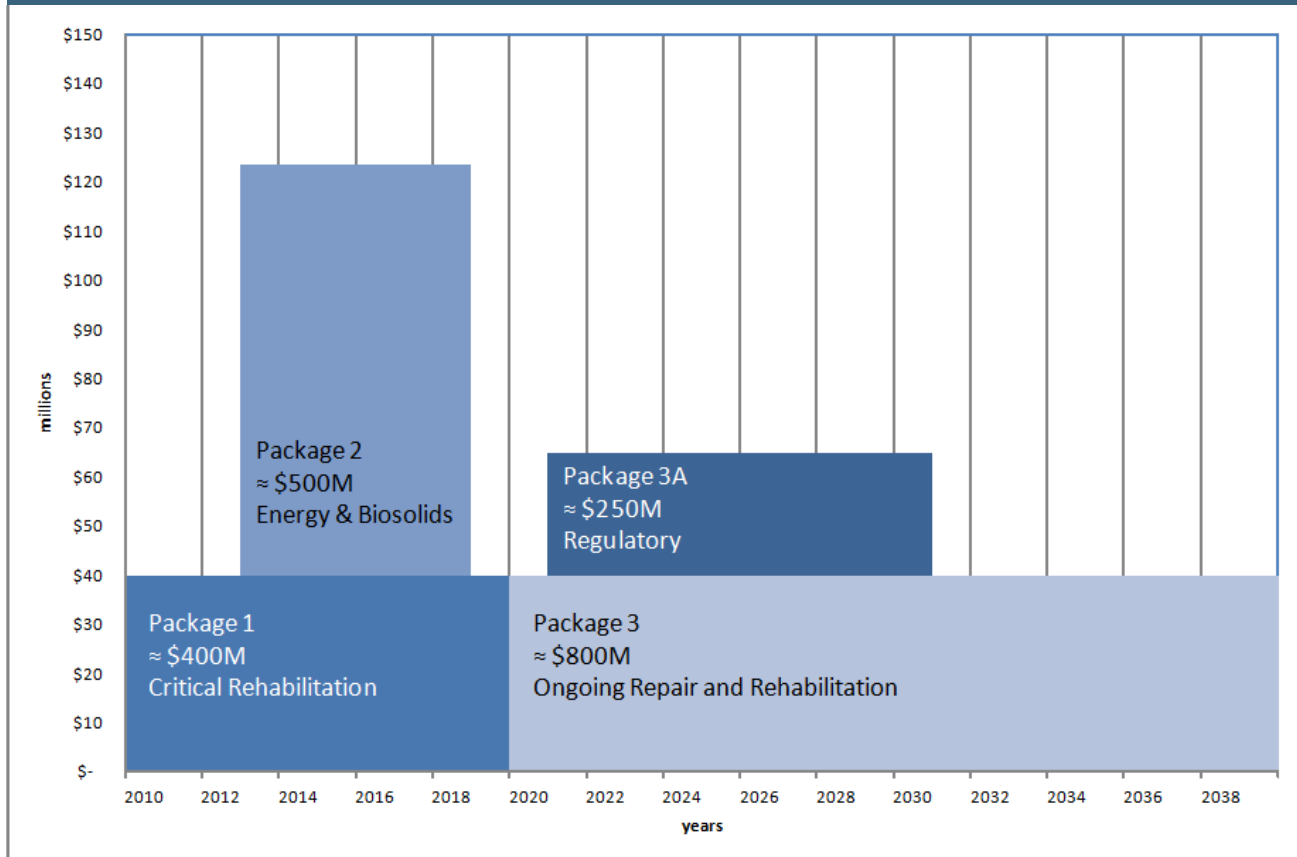
The CIP program strategy to rebuild and modernize the Facility includes partnering with the Public Works Department; hiring consultants for additional expertise in several key areas; and organizing capital projects into three "packages."

## Project Packages

In February 2012, the City Council approved the packaged delivery approach. This concept is illustrated in **Figure 1** on the next page.

- **Package 1** – This package includes critical rehabilitation projects in various process areas such as rebuilding the headworks; rehabilitating and seismically upgrading the primary and secondary tanks; rehabilitating the digesters, covers, and mixing systems; upgrading the gas handling and heating systems; and upgrading the electrical distribution systems. Altogether, costs for these projects are estimated to average \$40 million per year over the next 10 years, for a projected total of \$400 million. Package 1 projects will be supported by the current rate structure with moderate increases in future years.
- **Package 2** – This package includes projects that meet the priorities set forth by the Draft PMP and address significant challenges faced by the Facility, such as deteriorating power generation equipment and filter systems; and odor impacts to neighboring communities. Package 2 projects include transitioning from open-air biosolids drying to mechanical dewatering and drying; installing new gas turbines or advanced internal combustion engines to replace aging engine generators; and replacing existing gravity filters with newer filtration technology. Package 2 involves implementation of significant new technologies at an estimated cost of about \$500 million over six years. Package 2 projects will be financed to ease rate impacts on users and spread the costs over the infrastructure life. To the extent possible, existing funds will be used to pay for early project work.
- **Package 3 and 3A** – This package includes projects that are expected to exceed the 10-to-15 year implementation horizon, such as estimated end-of-life replacement of existing infrastructure and new projects that may be required based on future regulations or changes in wastewater flows and volume loads. The total cost of these projects over the 20-year period is estimated at \$1.05 billion, with a highly variable annual cost that is dependent on future regulatory and flow triggers.

**Figure 1 — Proposed Project Packages 1, 2, 3, and 3A**



### Package 1

#### Critical Rehabilitation

- Headworks Rehabilitation
- Primary Rehabilitation
- Secondary Rehabilitation
- Digester Rehabilitation
- Electrical Systems
- Controls and Automation
- Site Facility Improvements

### Package 2

#### New Technology

- Legacy Lagoon Cleanup
- Solids Dewatering and Drying
- Energy Generation
- Filter Reconstruction

### Package 3 and 3A

#### Regulatory, Flow, and Unspecified Repair and Rehabilitation

- Ongoing Repair and Rehabilitation
- Regulatory-Driven Improvements
- Flow-Driven Improvements

### III. Program Accomplishments and Challenges

**Several capital program milestones were achieved during the last two quarters of FY 2012-2013, including completion of five projects:**

Projects Completed	
On Schedule	On Budget
80 percent	40 percent

#### Administration Building Standby Generator

**Start date:** July 2010

**Baseline completion date:** NA **Actual completion date:** April 2013

**Baseline Budget:** \$262,520 **Actual Expenses:** \$306,059

**Original contract amount:** \$147,620 **Approved change orders:** \$14,118 (9.6%)

This project installed a standby diesel generator and supporting infrastructure to provide emergency power for the Facility's administration building. Emergency power is necessary in the event of an electrical power failure. The building houses the Facility's complex Distributed Control System (DCS) and computer servers that control critical aspects of plant operations.

#### Facilities Roof Replacement

**Start date:** October 2010

**Baseline completion date:** December 2012

**Actual completion date:** February 2013

**Baseline Budget:** \$870,770 **Actual Expenses:** \$694,860

**Original contract amount:** \$600,770 **Approved change orders:** \$22,462 (3.7%)

This project refurbished six roofs, including those of the Blower Generator, Nitrification, Sludge Controls, Filtration Influent Pump Station, Woodshop, and Maintenance buildings. The Facility has 25 major buildings with more than 287,000 square feet (SF) of roofing area that is 20 to 30 years old and requires maintenance.

#### Fire Main Replacement – Phase 2

**Start date:** October 2011

**Baseline completion date:** May 2013 **Actual completion date:** May 2013

**Baseline Budget:** \$1,398,550 **Actual Expenses:** \$1,266,004

**Original contract amount:** \$910,000 **Approved change orders:** \$177,993 (19.6%)

A 2007 condition assessment revealed corrosion and failure potential throughout the Facility's fire main piping system. This project is the second phase of a multi-phased project to address the assessment and replace existing fire main piping. Phase 2 replaced approximately 4,640 linear feet (LF) of main piping. The Facility's fire protection system is comprised of roughly 15,000 LF of piping, pumps, fire hydrants, and associated valves and appurtenances. The original system was installed in stages over the past 50 years to meet Facility expansion needs.

#### Handrail Replacement – Phase 4

**Start date:** September 2010

**Baseline completion date:** June 2013 **Actual completion date:** June 2013

**Baseline Budget:** \$765,680 **Actual Expenses:** \$846,194

**Original contract amount:** \$398,900 **Approved change orders:** \$69,558 (17.4%)

This project is the fourth phase in a multi-phased project to replace handrails and make minor repairs to deteriorated concrete. Phase 4 replaced approximately 2,500 LF of handrails in the secondary aeration process area. The Facility has approximately 17,000 LF of handrails.

## M1/M2/M3 Switchgear Replacement

**Start date:** July 2009

**Baseline completion date:** June 2013 **Actual completion date:** June 2013

**Baseline Budget:** \$10,402,025 **Actual Expenses:** \$10,971,668

**Original contract amount:** \$8,386,978 **Approved change orders:** \$1,249,143 (14.9%)

This project replaced three switchgears that had been in service for more than 40 years. The old switchgears were underrated for connection to the Facility's upgraded ring bus electrical distribution system. The new switchgears improve reliability and provide operating flexibility for the Facility.

## New construction contracts were awarded for six projects:

### 115 KV Circuit Breaker Replacement

**Award date:** April 2013 **Scheduled completion date:** August 2014

**Baseline Budget:** \$655,420 **Contract amount:** \$344,927

This project replaces two 115 kilovolt (KV) circuit breakers located in Substation No. 1. The breakers are 30 years old and require frequent maintenance due to gas leaks. The circuit breaker replacement will improve operations and reliability of the 115 KV system, and will reduce ongoing maintenance efforts and costs.

### Dissolved Air Flotation Dissolution Improvements

**Award date:** February 2013 **Scheduled completion date:** April 2014

**Baseline Budget:** \$891,000 **Contract amount:** \$535,000

This project installs new manifold and discharge pipes; check, gate, and butterfly valves; and actuators in the sludge control building. The dissolved air flotation system thickens the waste activated sludge from the secondary treatment process. Due to age, the existing discharge pipes, manifold, and valves are corroded, leaking, and vulnerable to failure. This project will improve system operations and reliability.

These six projects will improve Facility operations by repairing worn and corroded equipment and upgrading obsolete systems.



*Don Edwards National Wildlife Refuge*

### Distributed Control System Upgrade

**Award date:** June 2013 **Scheduled completion date:** June 2016

**Baseline Budget:** \$4,064,000 **Contract amount:** \$1,814,785

This project upgrades the DCS to support numerous operational areas. The DCS is comprised of software and hardware components that have been in place since the early 1990s. The existing operating system platform is nearing obsolescence and does not allow for expansion. This upgrade includes the system software and hardware, user interface, technical training, and system testing.

### Distributed Control System Fiber Optics Network Expansion

**Award date:** June 2013 **Scheduled completion date:** July 2014

**Baseline Budget:** \$957,000 **Contract amount:** \$589,000

This project expands the fiber optics network capacity to support the DCS. The fiber optics network serves as the communications connection between the DCS and various process areas and field devices. This project will install approximately 36,000 LF of new fiber optic cables in existing and new electrical and communication conduit, as well as 100 high-density fiber patch panels and enclosures.

## Handrail Replacement – Phase 5

**Award date:** June 2013 **Scheduled completion date:** September 2015

**Baseline Budget:** \$1,855,093 **Contract amount:** \$1,254,630

This project is the fifth phase in a multi-phased project that replaces existing steel handrails and repairs deteriorated concrete surfaces around the secondary aeration tanks. The existing handrails are more than 40 years old and have deteriorated due to long-term exposure to the Facility's harsh environment. Phase 5 replaces approximately 8,500 LF of handrails.

## Influent Magnetic Meter and Valve Replacement for Nitrification Clarifiers A-5 and A-6

**Award date:** May 2013 **Scheduled completion date:** June 2014

**Baseline Budget:** \$437,330 **Contract amount:** \$270,300

Due to age and corrosion, the influent magnetic flowmeters and signal converters in nitrification clarifiers A-5 and A-6 are out of service. Additionally, the butterfly valves leak and flow control valve actuators are not properly functioning. This project will replace these components along with associated electrical, instrumentation, and structural improvements.

## Street Rehabilitation – Phase 2

**Award date:** June 2013 **Scheduled completion date:** April 2014

**Baseline Budget:** \$443,600 **Contract amount:** \$279,598

This project is the second phase of a multi-phased rehabilitation of the Facility's five miles of streets and access roads. Many street sections have pavement failure, unraveling, potholing, damaged curbs and gutters, and poor drainage. This project rehabilitates approximately 2,600 LF of pavement along Main Street from the Facility's main gate to Center Street.



*Rehabilitated Facility street*

## Additional Accomplishments

- Five service orders totaling \$2.3 million were awarded under existing master agreements to initiate consultant work on several projects, including Ammonia & TSS Meters Installation, Digester Gas Storage Replacement, Emergency Diesel Generators, and the New Cogeneration Facility.
- Staff advertised a Request for Proposals (RFP) on February 25, 2013 for engineering design, construction support, testing, and commissioning services for the Digester and Thickener Facilities Upgrade project. Contract negotiations are currently underway and award is expected in October 2013.
- Staff advertised an RFP on March 28, 2013 for a program management firm to provide a broad array of services and program tools to manage the capital program. Key services to be provided include validating the existing and proposed CIP and Draft PMP projects, and establishing program-wide standards and systems, including budgetary and schedule controls. Contract negotiations are currently underway and award is expected in October 2013.
- On January 24, 2013, the City Manager approved a one-year consultant contract for a Program Technical Coordinator to lead coordination and communication between Facility's Operations and Maintenance staff and Capital Program staff, for optimal CIP implementation.
- On March 26, 2013, Council approved an initial one-year consultant contract for an Executive Program Advisor, with the option of yearly contract renewal for the next four years. The Executive Program Advisor will lead capital program planning, organization, and management for the Facility.

To address staffing, systems, and program delivery challenges, a program management consultant will begin working with Facility staff in Fall 2013.

## Challenges

For successful delivery of the large and complex Facility CIP, staff must meet the following key challenges:

- **Recruit and fill key vacancies** – Experienced project managers, designers and process engineers; operations and maintenance staff; and additional program support staff are critical to program success. Some of these staff are already in place; however, a number of vacancies in both the CIP and Operations and Maintenance divisions still need to be filled. Recruitments are underway with the recognition that new staff will need time and training to become completely familiar with the Facility, its systems and operations.
- **Build foundational systems** – Key systems are required for the long-term success and effective CIP oversight. Schedule and budget control, document management, and asset management systems are all needed. Development and rollout of these systems may present some initial challenges for staff. However, with training and continued use, the systems should promote accountability, efficiency, and improved planning and decision making.
- **Develop program delivery processes** – Clear governance, processes, and procedures are needed to manage risk and provide a standard approach for effective and efficient program and project delivery. Standardized project delivery tools; design standards and specifications; control system and integration strategies; startup; commissioning; and training procedures all need to be developed and implemented.

To address these challenges, a program management consultant will be brought on board in Fall 2013. The months following will be critical for the program as in-house staff and consultant staff integrate and collaborate on efforts including:

- Establishing the program management plan and office;
- Validating and prioritizing the more than 100 projects recommended by the Draft PMP, including conducting gap analyses and construction sequencing reviews; and
- Developing communications and program decision-making protocols.

Other significant challenges include exploring financing options and alternative delivery methods, including obtaining design-build authority for implementation of Package 2 projects.

## IV. CIP Project Performance

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### Performance Measures

A key goal of this Semiannual Status Report is to provide regular updates on project performance based on schedule and budget commitments. Project schedules and budgets described in this report follow the same definitions and conventions as the Citywide CIP Annual Status Report.

### Schedules

Baseline schedules are established as a commitment for delivery and a measurement of on-time project delivery performance. Project schedules are set once project scope and requirements have been established, and fall into one of the following categories:

- **On schedule:** Projects are considered to be on schedule if completed within two months of the committed completion date. Projects are also in this category if no schedule commitment existed prior to this report.
- **Extended schedule:** Projects have extended schedules if they are running more than two months behind the committed delivery date.
- **Schedule reset:** Project schedules are reset when committed schedules are no longer feasible as a result of significant changes in scope, bid protests, or Council-directed reprioritization. This reset process occurs as part of the City Council's consideration of the Citywide Annual CIP Status Report.
- **Schedule pending:** Projects that do not have schedules at the time of this report are noted as pending. The schedules for these projects are uncertain due to incomplete scoping, community concerns, or funding issues.
- **Schedule on hold:** Project schedules that have been deferred are placed on hold.

### Phases

CIP projects are described as progressing through the following phases:

- **Planning.** Work can include condition assessments, pilot tests, feasibility studies, scope development, preliminary engineering, and environmental clearance.
- **Design.** Work can include preparation and review of plans and specifications, selection and management of consultants, and project coordination.
- **Bridging Documents.** These documents and drawings describe all components that go into building, and are designed to give each design-build bidder a clear understanding of what the Facility requirements on a given project.
- **Bid and Award.** Work can include bid advertisement, pre-bid meetings, preparation of addenda, evaluation of bids, and recommendation for award.
- **Construction.** Work can include execution of contract and issuance of the Notice to Proceed, construction management, and construction inspection.
- **Design-Build.** A combination of design and construction phase tasks performed by the design-build contractor, based on plans and specifications developed during the bridging documents phase.
- **Post-construction/startup.** Work can include final inspection, project closeout, warranty tracking and documentation, operations and maintenance training, startup, and commissioning.

### Budgets

Baseline budgets are established as a commitment for delivery and a measurement of on-budget project delivery performance. Project budgets are generally established once the project scope is complete and a schedule has been determined. Projects are considered on budget if total project costs are within 1 percent of the established baseline budget. The baseline budget may differ from the CIP budget in that baseline budgets may include funding that has not yet been identified and appropriated by the City Council. Any resets of baseline budgets will occur during Council consideration of the Citywide Annual CIP Status Report.

## Performance Summary

**Table 2** shows active projects by phase. Several projects are in the Conceptual Planning phase, which precedes the Planning phase. These projects do not yet have detailed scopes, schedules, or budgets. In order for a baseline schedule and budget to be established, a project in the Conceptual Planning phase will require further clarification and refinement of project goals; environmental clearance; and engineering analysis, such as feasibility studies and technology evaluations. Projects in the Conceptual Planning phase are included in **Table 3** on page 20.

In addition, a summary chart of current active projects with budgets and schedules is provided on the next page in **Figure 2**.

The Facility's CIP projects have been renumbered according to the Capital Project Management System (CPMS). This system links interested viewers to a web-based database that provides greater detail on projects. The CPMS can be accessed at: <http://sanjoseca.gov/index.aspx?NID=295>

Table 2 — Active Projects by Phase	
Project Phase	Number of Projects
Conceptual Planning	11
Planning	4
Design/Bridging Documents	8
Bid and Award	4
Construction	3
Design-Build	0
Post-Construction/Startup	6
<b>Total</b>	<b>36</b>



*Clarifier tank*

### Figure 2 — 2013-2017 Project Schedule and Budget Chart

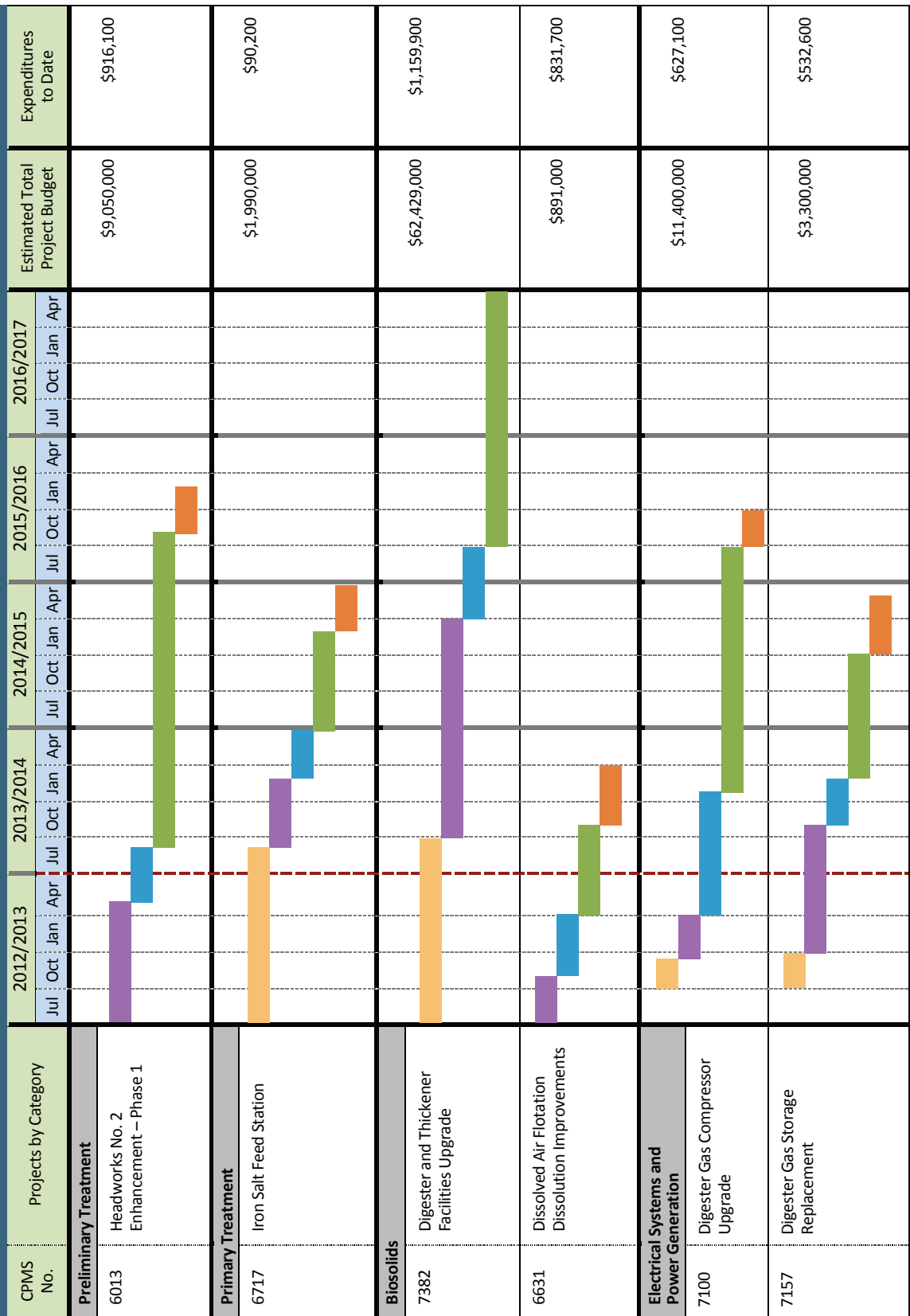


Figure 2 continued

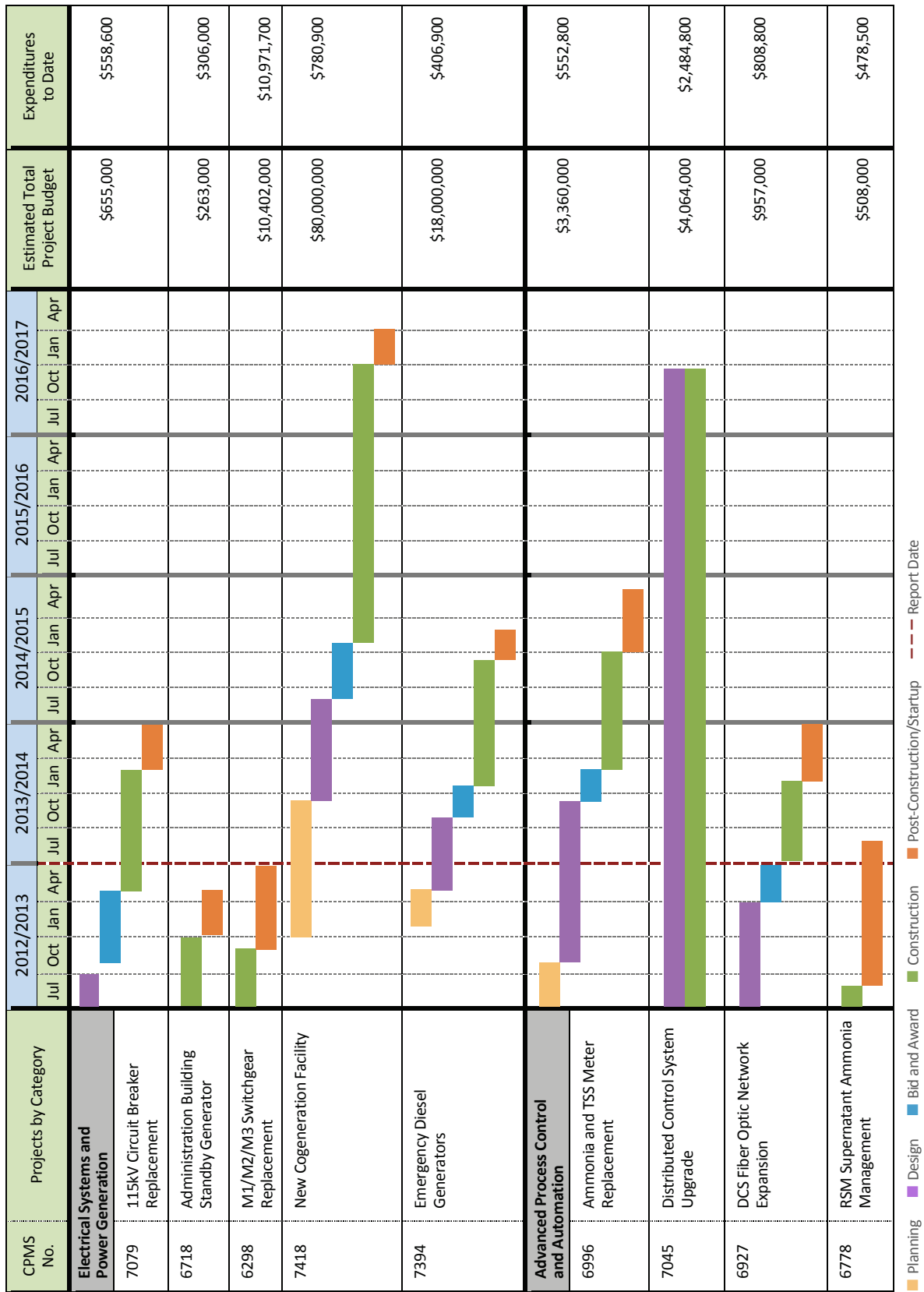
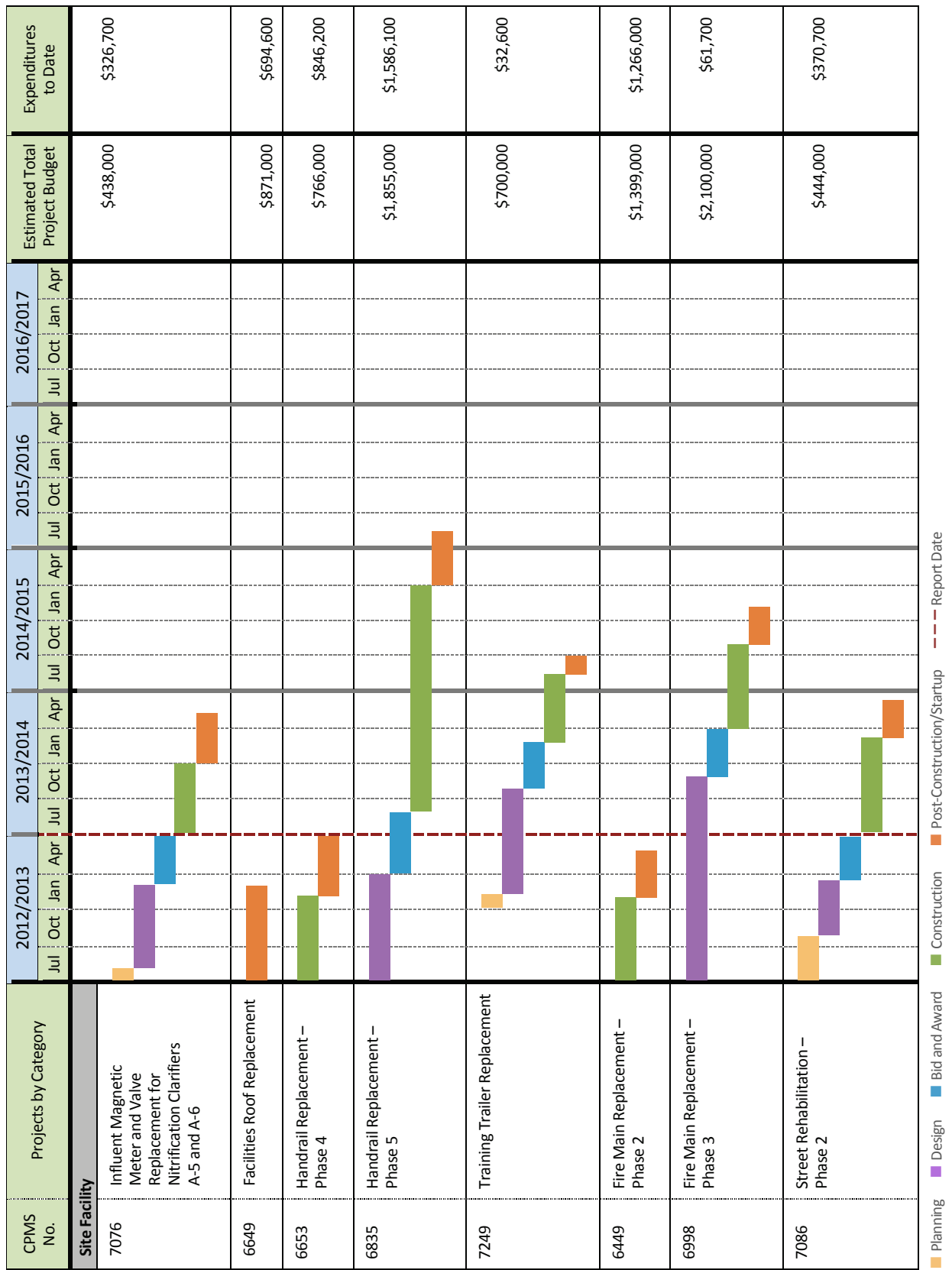


Figure 2 continued



**Table 3 – 2013-2017 Project Schedule and Budget – Conceptual Planning**

Project by Category	Adopted Project Budget
<b>Preliminary Treatment</b>	
Headworks No. 1 Repair and Rehabilitation	\$5,975,000
Headworks No. 2 Expansion	\$79,400,000
<b>Primary Treatment</b>	
East Primary Rehabilitation	\$82,025,000
<b>Secondary Treatment</b>	
Biological Nutrients Removal 1 and 2 Connection	\$14,486,000
Fine Bubble Membrane Diffuser Conversion	\$36,400,000
Secondary and Nitrification Clarifier Rehabilitation	\$26,427,000
<b>Tertiary Treatment</b>	
New Filter Complex	\$1,000,000
<b>Biosolids</b>	
Biosolids Transition	\$1,000,000
<b>Electrical Systems and Power Generation</b>	
Switchgears S40, G3 & G3A, and M4 Controls Upgrade	\$1,300,000
<b>Site Facility</b>	
Plantwide Facilities	\$650,000

## V. Capital Project Highlights

This section provides a detailed look at selected CIP projects and key Facility improvements. These projects showcase work that is critical to ongoing Facility operations. Some, like the New Cogeneration Facility project, also pave the way for continued innovation and efficiency in how the Facility produces and uses energy.

**Figure 4** below shows the location of each project at the Facility site.

In addition to information on project description, benefits, status, schedule, and budget, each page in the highlights section shows a budget estimate level. Capital project budget estimate levels are defined as:

- **Program level:** Created for long-term planning and initial feasibility studies; level of certainty plus or minus 35 percent.
- **Preliminary level:** Based on planned sizes of buildings and functional areas, not formal engineering work; level of certainty plus or minus 20 percent.
- **Budget level:** Based on current scope and schematic design work derived from previous similar projects; level of certainty plus or minus 10 percent.
- **Engineer's level:** Based on final construction plans and specifications; level of certainty plus or minus five percent.

**Figure 4 – Locations of Highlighted Projects**



## PRELIMINARY TREATMENT



Headworks bar screens

## Headworks No. 2 Enhancement Phase 1

**Estimate Type:** Budget Level  
**Current Project Budget:** \$9,050,000  
**CPMS No.** 6013

### Description

This project will make enhancements to Headworks No. 2 so that it can ultimately serve as the main headworks. Phase 1 work will include modifications to the raw sewage distribution structure, construction of a new connection pipeline, and re-routing of recycle and other process water flows that currently connect to Headworks No. 1.

### Current Status

The project design is being finalized. The project bid and award is on hold pending completion of a third party headworks expansion and operational feasibility review. This review will identify improvements necessary to provide reliable short- and long-term preliminary treatment and a strategy for future expansion of the headworks capacity to best suit Facility requirements.

### Next Milestone

Complete third party feasibility review: *Fall 2013*

## PRIMARY TREATMENT



Dosing station

## Iron Salt Feed Station

**Estimate Type:** Program Level  
**Current Project Budget:** \$1,990,000  
**CPMS No.** 6717

### Description

This project will design and construct a chemical dosing station to add iron salt and polymer to incoming wastewater. Iron salt helps control the formation of hydrogen sulfide gas, reduce corrosion and odor, and enhance the settling of sludge. Hydrogen sulfide gas is sometimes present at high levels in the Facility's digesters, and is a potential air quality problem. Work will include construction of a chemical feed station and a concrete containment structure, as well as installation of pumps, piping, and instrumentation to dose and deliver the iron salt solution.

### Current Status

Staff are studying suitable locations for the new chemical feed station and are negotiating a consultant service order. Design was anticipated to start in Spring 2013; however, the start date was rescheduled to Fall 2013 due to staffing issues.

### Next Milestone

Issue service order for design services: *Fall 2013*

For more information on CIP projects, visit <http://ca-sanjose.civicplus.com/index.aspx?NID=295>

## TERTIARY TREATMENT



*Disc filters*

### New Filter Complex

**Estimate Type:** Program Level  
**Conceptual Program Budget:** \$134,000,000  
**Current Project Budget:** \$1,000,000  
**CPMS No. 7448**

#### Description

The Facility's 1970s-era gravity filters need to be refurbished or replaced with more efficient and advanced filter technologies. This project will evaluate and potentially pilot test one or more new replacement filter technologies in advance of a full-scale transition to a new filter complex.

#### Current Status

A feasibility study is underway with completion projected for Fall 2013. Facility staff participated in a technology review workshop and completed site visits of other deep gravity and disc filter facilities to obtain input on these technologies from other agencies. Depending on the outcome of the technology evaluation and pilot testing efforts, additional funding for full-scale project implementation may be incorporated in future CIPs.

#### Next Milestone

Final evaluation report: *Fall 2013*

## BIOSOLIDS



*Digesters*

### Digester and Thickener Facilities Upgrade

**Estimate Type:** Budget Level  
**Current Project Budget:** \$62,429,000  
**CPMS No. 7382**

#### Description

The Facility has 16 anaerobic digesters constructed between 1956 and 1983. Six of these digesters are out of service due to age and condition; all are more than 30 years old. The first phase of this project will rehabilitate four digesters (Nos. 5, 6, 7, and 8), including installing new covers and mixing systems; heating system and gas collection system upgrades; structural and seismic retrofits; electrical, instrumentation and control system upgrades; and Dissolved Air Flotation Thickeners modifications to allow for sludge co-thickening including new odor control.

#### Current Status

A Request for Qualifications (RFQ) for professional engineering services was issued in March 2013. Contract negotiations are underway with the contract award scheduled for September 2013.

#### Next Milestone

Design contract award: *Fall 2013*  
Design completion: *Spring 2015*

For more information on CIP projects, visit <http://ca-sanjose.civicplus.com/index.aspx?NID=295>

## BIOSOLIDS



*Lagoon for drying sludge*

### New Biosolids Facility (Package 2)

**Estimate Type:** Program Level  
**Conceptual Program Budget:** \$326,000,000  
**Current Project Budget:** \$1,000,000  
**CPMS No. 7449**

#### Description

Covered mechanical dewatering and drying of sludge, coupled with new odor treatment technologies, would require a much smaller operational footprint than the Facility's current air-drying method. It would also improve odor impacts to surrounding communities. This project will study, evaluate, and develop a project definition report in advance of full-scale transition to a new biosolids processing operation. Reserves have been set aside in the CIP for further development of a new biosolids processing complex concept. Depending on the outcome of the technology study, additional funding for full-scale project implementation may be incorporated in future CIPs as part of Package 2 projects.

#### Current Status

An Owner's Engineer is being hired to assist with scope definition and project delivery approach. An Owner's Engineer is an engineer or firm who acts as an advocate for the owner on highly specialized and complex projects. Because this project is in the conceptual planning phase, a detailed schedule and budget is not yet available.

#### Next Milestone

Issue service order for an Owner's Engineer and seek design-build authority from state legislators: *Fall 2013*

## ELECTRICAL SYSTEMS AND POWER GENERATION



*Existing digester gas compressor*

### Digester Gas Compressor Upgrade

**Estimate Type:** Budget Level  
**Current Project Budget:** \$11,400,000  
**CPMS No. 7100**

#### Description

The Facility operates three digester gas compressors located in the Sludge Control Building: two smaller gas compressors installed in 1964, and one installed in 1984. The two older compressors are increasingly unreliable and difficult to maintain. The newer compressor is also nearing the end of its useful life due to continuous use. This project will construct an approximately 4,400 SF building to house two new gas compressors, located north of the existing Sludge Control Building.

#### Current Status

The preliminary engineering design was completed in April 2013. Staff are currently preparing contractor prequalification documents for low-bid/design-build procurement.

#### Next Milestone

Design completion and contractor prequalification:

*Fall 2013*

For more information on CIP projects, visit <http://ca-sanjose.civicplus.com/index.aspx?NID=295>

## ELECTRICAL SYSTEMS AND POWER GENERATION



*Gas holder*

### Digester Gas Storage Replacement

**Estimate Type:** Budget Level

**Current Project Budget:** \$3,300,000

**CPMS No.** 7157

#### Description

The Facility has an existing digester gas holding tank that was originally built in 1984. The tank's gas holder experienced two failures, one in 2002, and one in 2012. A structural evaluation during the 2012 failure revealed the gas holder cover skirt was damaged beyond repair. This project will replace the existing wet seal gas holder with a new gas storage unit.

#### Current Status

The conceptual design has been finalized for the type of gas storage unit that is to replace the existing gas holder. Different gas holders were compared on capital, operation, maintenance, and overall life-cycle costs. A preliminary design review is underway to confirm project direction prior to proceeding with the detailed design.

#### Next Milestone

Design completion:

*Fall 2013*

## ELECTRICAL SYSTEMS AND POWER GENERATION



*1.5 MW standby generator*

### Emergency Diesel Generators

**Estimate Type:** Program Level

**Current Project Budget:** \$18,000,000

**CPMS No.** 7394

#### Description

This project was recommended in the 2012 Energy Management Strategic Plan for energy reliability in the event of power loss. The project installs four emergency diesel generators with capacity of 3 MW each. The generators will automatically start and energize the Facility's ring bus electrical distribution system within five minutes after a power outage. The generators will be located south of Substation 1, in the southwest area of the Facility, and will connect to the M3 switchgear.

#### Current Status

The project will be bid as low-bid/design-build. Bridging and contractor prequalification documents are being developed.

#### Next Milestone

Thirty percent Conceptual Design Documents: *Fall 2013*

For more information on CIP projects, visit <http://ca-sanjose.civicplus.com/index.aspx?NID=295>

## ELECTRICAL SYSTEMS AND POWER GENERATION



4 MW advanced internal combustion engines

### New Cogeneration Facility (Package 2)

**Estimate Type:** Program Level

**Conceptual Program Budget:** \$80,000,000

**Current Project Budget:** \$1,300,000

**CPMS No. 7418**

#### Description

Improvements will include a new cogeneration building that will house four new, advanced 4 MW internal combustion engines. The engines' fuel source will be a blend of Facility digester gas and natural gas. Additional improvements include a gas treatment system, a new gas conveyance pipeline, emissions controls, system controls, and maintenance spaces.

#### Current Status

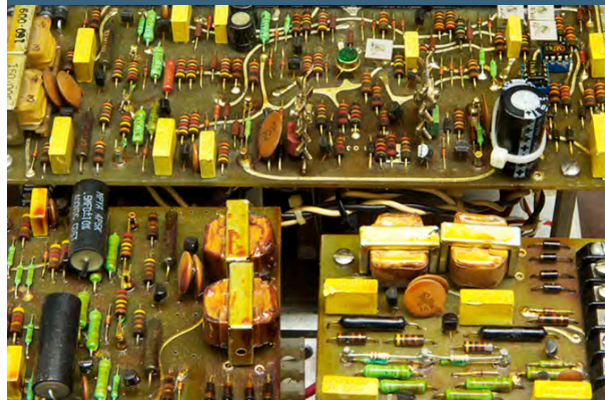
A detailed study of engine requirements was performed and an engine was selected. Staff is currently finalizing the scope definition and project delivery approach. An RFP will be issued for an architect/engineer team to produce a set of abbreviated construction documents and specifications.

#### Next Milestone

Scope completion:

*Fall 2013*

## ADVANCED PROCESS CONTROL AND AUTOMATION



Distributed control system

### Distributed Control System (DCS) Upgrade

**Estimate Type:** Budget Level

**Current Project Budget:** \$4,064,000

**CPMS No. 7045**

#### Description

This project upgrades the Facility's DCS, which monitors and controls many operational areas. The DCS is comprised of software and hardware components that have been in place since the early 1990s. The existing operating system platform is nearing obsolescence and will be phased out by the manufacturer in 2015. This upgrade includes the system software and hardware, user interface, technical training, and system testing.

#### Current Status

An RFQ was issued in August 2012. The contract was awarded in June 2013.

#### Next Milestone

Project completion:

*Summer 2016*

For more information on CIP projects, visit <http://ca-sanjose.civicplus.com/index.aspx?NID=295>

## SITE FACILITY IMPROVEMENTS



*Fire main trench*

## Fire Main Replacement Phase 3

**Estimate Type:** Budget Level

**Current Project Budget:** \$2,100,000

**CPMS No.** 6998

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### Description

This project will replace approximately 8,000 LF of pipe along with associated valves, fire hydrants, and appurtenances. The Facility's fire protection system has more than 15,000 LF of fire mains consisting of cast iron and ductile iron pipes installed in stages over the past 50 years. A 2007 condition assessment revealed corrosion and potential piping failure throughout the system. As a result, a phased approach for replacement of the existing fire main system with corrosion-resistant plastic piping was initiated in FY 2007-2008.

### Current Status

Fifty percent design drawings and specifications completion is expected by July 2013.

### Next Milestone

Design completion:

*Fall 2013*

For more information on CIP projects, visit <http://ca-sanjose.civicplus.com/index.aspx?NID=295>

## VI. Financial Summaries

The following Financial Summaries Chart reflects project costs as adopted in the 2012-2013 CIP Budget. The chart also includes reserves, transfers, and non-construction elements that are not discussed in this status report.

### 2013-2017 Adopted Capital Improvement Program – Use of Funds (Combined)

	Estimated 2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	5-Year Total
<b>Construction Projects</b>							
<b>Public Art</b>							
Public Art	193,000	546,000	12,000	123,000	3,000		684,000
<b>Total</b>	<b>193,000</b>	<b>546,000</b>	<b>12,000</b>	<b>123,000</b>	<b>3,000</b>		<b>684,000</b>
<b>Preliminary Wastewater Treatment</b>							
1. Headworks No. 1 Repair and Rehabilitation		600,000	5,050,000	325,000			5,975,000
2. Headworks No. 2 Enhancement	500,000	6,715,000	225,000				6,940,000
3. Headworks No. 2 Expansion		500,000					500,000
<b>Total</b>	<b>500,000</b>	<b>7,815,000</b>	<b>5,275,000</b>	<b>325,000</b>			<b>13,415,000</b>
<b>Primary Wastewater Treatment</b>							
4. East Primary Rehabilitation, Seismic Retrofit, and Odor Control	13,000	1,715,000	2,000,000	5,000,000	9,760,000	12,820,000	31,295,000
5. Iron Salt Feed Station	422,000	1,918,000					1,918,000
<b>Total</b>	<b>435,000</b>	<b>3,633,000</b>	<b>2,000,000</b>	<b>5,000,000</b>	<b>9,760,000</b>	<b>12,820,000</b>	<b>33,213,000</b>
<b>Secondary Wastewater Treatment</b>							
6. Biological Nutrients Removal 1 and Biological Nutrients Removal 2 Connection		876,000	1,000,000	12,328,000	282,000		14,486,000
7. Fine Bubble Membrane Diffuser Conversion		1,000,000		2,166,000	1,770,000	2,478,000	7,414,000
8. Secondary and Nitrification Clarifier Rehabilitation	594,000	3,175,000	516,000	2,800,000	6,939,000	578,000	14,008,000
<b>Total</b>	<b>594,000</b>	<b>5,051,000</b>	<b>1,516,000</b>	<b>17,294,000</b>	<b>8,991,000</b>	<b>3,056,000</b>	<b>35,908,000</b>

	Estimated 2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	5-Year Total
<b>Construction Projects</b>							
<b>Tertiary Wastewater Treatment</b>							
9. Alternative Disinfection	1,000	1,000,000					1,000,000
10. Filter Improvements		822,000					822,000
11. New Filter Technology		1,000,000					1,000,000
<b>Total</b>	<b>1,000</b>	<b>2,822,000</b>					<b>2,822,000</b>
<b>Biosolids</b>							
12. Biosolids Transition Technology*		1,000,000					1,000,000
13. Digester Rehabilitation	660,000	12,480,000	47,000,000	3,000,000	1,100,000		63,580,000
14. Dissolved Air Flotation Rehabilitation and Odor Control	158,000	1,000,000					1,000,000
15. Inactive Lagoons Biosolids Removal	267,000	585,000					585,000
<b>Total</b>	<b>1,085,000</b>	<b>15,065,000</b>	<b>47,000,000</b>	<b>3,000,000</b>	<b>1,100,000</b>		<b>66,165,000</b>
<b>Electrical Systems and Power Generation</b>							
Fuel Cell	1,145,000	20,000					20,000
16. Combined Heat and Power Equipment Repair and Rehabilitation		3,200,000					3,200,000
17. Combined Heat and Power Technology Evaluation*		1,300,000					1,300,000
18. Plant Electrical Reliability	8,910,000	1,047,000	2,000,000				3,047,000
<b>Total</b>	<b>10,055,000</b>	<b>5,567,000</b>	<b>2,000,000</b>				<b>7,567,000</b>
<b>Advanced Process Control &amp; Automation</b>							
19. Advanced Process Control and Automation	498,000	1,847,000	640,000				2,487,000
20. Treatment Plant Distributed Control System	65,000	2,500,000	500,000	500,000	500,000		4,000,000
<b>Total</b>	<b>563,000</b>	<b>4,347,000</b>	<b>1,140,000</b>	<b>500,000</b>	<b>500,000</b>		<b>6,487,000</b>

\*Package 2 project

	Estimated 2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	5-Year Total
<b>Construction Projects</b>							
<b>Site Facility Maintenance and Improvements</b>							
Outfall Channel and Levee Improvements	250,000						
WPCP Reliability Improvements	21,000						
21. Equipment Replacement	3,959,000	1,663,000	1,663,000	1,663,000	1,663,000	1,663,000	8,315,000
22. Plant Infrastructure Improvements	8,898,000	4,665,000	1,000,000	1,000,000	1,000,000	1,000,000	8,665,000
23. Plantwide Facilities		645,000					645,000
24. Treatment Plant Engine Rebuild	1,000,000	1,000,000	1,000,000				2,000,000
25. Treatment Plant Fire Main Replacement	1,155,000	1,245,000					1,245,000
26. Treatment Plant Street Resurfacing	360,000	715,000	500,000	500,000	500,000	500,000	2,715,000
27. Unanticipated/Critical Repairs	250,000	250,000	250,000	250,000	250,000	250,000	1,250,000
28. Urgent and Unscheduled Treatment Plant Rehabilitation	250,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	7,500,000
<b>Total</b>	<b>16,143,000</b>	<b>11,683,000</b>	<b>5,913,000</b>	<b>4,913,000</b>	<b>4,913,000</b>	<b>4,913,000</b>	<b>32,335,000</b>
<b>South Bay Water Recycling</b>							
Recovery Act - South Bay Water Recycling Phase 1C	1,075,000	72,000					72,000
SBWR Customer Connection Program	1,000,000						
SBWR Reservoir Facility	2,939,000	120,000					120,000
29. SBWR Backup Water	838,000	2,162,000					2,162,000
30. SBWR Extension	9,788,000	4,093,000					4,093,000
31. SBWR System Reliability and Infrastructure Replacement		2,000,000	1,500,000	1,500,000	1,500,000		6,500,000
<b>Total</b>	<b>15,640,000</b>	<b>8,447,000</b>	<b>1,500,000</b>	<b>1,500,000</b>	<b>1,500,000</b>		<b>12,947,000</b>
<b>TOTAL CONSTRUCTION PROJECTS</b>	<b>45,209,000</b>	<b>64,976,000</b>	<b>66,356,000</b>	<b>32,655,000</b>	<b>26,767,000</b>	<b>20,789,000</b>	<b>211,543,000</b>

	Estimated 2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	5-Year Total
<b>Non-Construction Projects</b>							
<b>General Non-Construction</b>							
Capital Program and Public Works Department Support Service Costs	300,000	574,000	580,000	586,000	592,000	598,000	2,930,000
Transfer to Clean Water Financing Authority Debt Service Payment Fund	6,956,000	6,947,000	6,953,000	6,915,000	6,943,000	6,787,000	34,545,000
32. Payment for Clean Water Financing Authority Trustee	5,000	5,000	5,000	5,000	5,000	5,000	25,000
33. Plant Master Plan	2,086,000	900,000					900,000
34. Preliminary Engineering		1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	5,000,000
35. Program Management		2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	10,000,000
36. SBWR Master Plan		2,304,000					2,304,000
37. State Revolving Fund Loan Repayment	4,464,000	4,464,000	4,464,000	4,464,000	4,464,000	4,464,000	22,320,000
<b>Total</b>	<b>13,811,000</b>	<b>18,194,000</b>	<b>15,002,000</b>	<b>14,970,000</b>	<b>15,004,000</b>	<b>14,854,000</b>	<b>78,024,000</b>
<b>Contributions, Loans and Transfers to General Fund</b>							
Transfer to the General Fund: Human Resources/Payroll System Upgrade	10,000						
<b>Total</b>	<b>10,000</b>						
<b>Contributions, Loans and Transfers to Special Funds</b>							
Transfer to the City Hall Debt Service Fund	47,000	77,000	82,000	85,000	89,000	93,000	426,000
Transfer to the Federated Retirement Fund for 2010-2011 Additional Payment	58,000						
<b>Total</b>	<b>105,000</b>	<b>77,000</b>	<b>82,000</b>	<b>85,000</b>	<b>89,000</b>	<b>93,000</b>	<b>426,000</b>

	Estimated 2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	5-Year Total
<b>Non-Construction Projects</b>							
<b>Reserves</b>							
Reserve for Advanced Process Control and Automation		3,000,000					3,000,000
Reserve for Biosolids Transition		5,000,000					5,000,000
Reserve for Digester Rehabilitation		5,000,000					5,000,000
Reserve for East Primary Rehabilitation, Seismic Retrofit, and Odor Control		1,000,000					1,000,000
Reserve for Electrical Systems and Power Generation		10,000,000					10,000,000
Reserve for Equipment Replacement		5,000,000					5,000,000
Reserve for Headworks		6,000,000					6,000,000
Reserve for New Filter Complex		6,000,000					6,000,000
<b>Total</b>		<b>41,000,000</b>					<b>41,000,000</b>
<b>TOTAL NON-CONSTRUCTION</b>	<b>13,926,000</b>	<b>59,271,000</b>	<b>15,084,000</b>	<b>15,055,000</b>	<b>15,093,000</b>	<b>14,947,000</b>	<b>119,450,000</b>
<b>Ending Fund Balance</b>	<b>104,635,097</b>	<b>20,091,097</b>	<b>6,417,097</b>	<b>5,316,097</b>	<b>6,785,097</b>	<b>8,187,097</b>	<b>8,187,097*</b>
<b>TOTAL USE OF FUNDS</b>	<b>163,770,097</b>	<b>144,338,097</b>	<b>87,857,097</b>	<b>53,026,097</b>	<b>48,645,097</b>	<b>43,923,097</b>	<b>339,180,097*</b>

\* The 2012-2013 through 2015-2016 Ending Balances are excluded from the FIVE-YEAR TOTAL USE OF FUNDS to avoid multiple counting of the same funds.

## VII. Looking Ahead

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*Aerial view of Facility site looking eastward.*

Significant activity is expected over the next six months, particularly in establishing an integrated program management office. This office will oversee an intensive process to validate and prioritize more than 100 projects recommended by the Draft PMP, and is expected to result in potential cost savings and more informed decision making for future CIPs. Key upcoming activities include:

- Award of the program management contract;
- Substantial completion of CIP project validation by the program management team;
- Initiation of design for the Digester and Thickener Facilities Upgrade Project;
- Completion of an anaerobic digestion process analysis and a preferred approach selection;
- Initiation of an analysis on biosolids treatment and disposal options;
- Issuance of RFPs for the Digester Gas Compressor Upgrade and Emergency Generator projects; and
- Completion of a Project Definition Report for the Cogeneration Facility Project.

# Glossary

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<b>Biogas</b>	A renewable energy source produced by the breakdown of organic matter, such as sewage or green waste, in the absence of oxygen. Biogas is comprised of methane, carbon dioxide, and small amounts of hydrogen sulfide and other components.
<b>Biosolids</b>	Treated sewage sludge.
<b>Bufferlands</b>	Open acreage used by wastewater treatment plants as a buffer between facility operations and nearby communities. Bufferlands minimize odor and operational impacts on neighboring communities, and often serve as wildlife habitat.
<b>Cogeneration</b>	The process of recovering and reusing industrial waste heat to produce electricity.
<b>CPMS</b>	The Capital Project Management System, a web-based database updated regularly to provide San José Councilmembers, administrators and the public access to current information on CIP projects.
<b>DCS</b>	A Distributed Control System, or DCS, is a computerized system that allows treatment facility staff to remotely monitor and control treatment processes.
<b>Effluent</b>	Treated wastewater that is discharged from a treatment facility.
<b>EIR</b>	An Environmental Impact Report (EIR) is a public document required under the California Environmental Quality Act to describe potential environmental impacts associated with a project. An EIR also describes measures to mitigate the impacts.
<b>Headworks</b>	Facilities that first receive incoming wastewater at a treatment plant. The headworks screen and remove sticks, grit, and other solid material from influent to protect downstream equipment in the treatment process.
<b>Influent</b>	Untreated wastewater that flows into a treatment facility.
<b>mgd</b>	Million gallons per day.
<b>Preliminary treatment</b>	The preparatory wastewater treatment stage, in which influent passes through headworks, which screen and remove sticks, rocks and debris; and grit chambers, which remove sand and gravel.
<b>Primary treatment</b>	The initial treatment for incoming wastewater, in which gravity settles solid material and rotating bars skim floating fats, oil, and grease from influent.
<b>Ring bus system</b>	An electrical substation switching arrangement of breakers connected in a closed loop.
<b>Secondary treatment</b>	The second stage of wastewater treatment, in which aeration tanks pump air into wastewater to promote the growth of naturally-occurring bacteria that remove organic pollutants.
<b>Tertiary treatment</b>	The final stage in advanced wastewater treatment, in which wastewater flows through filter beds, then through sodium bisulfite tanks to become 99 percent clean.
<b>Wastewater</b>	Water that enters the sanitary sewer system for processing at a treatment plant.

# Appendix

Preliminary Treatment Projects – Adopted FY 2013-2017 CIP budget: \$13.4 million		
Draft PMP ID #	Project	Draft PMP Cost Estimate* (in millions)
1	Headworks Enhancements Phase 1 and Phase 2	\$6.7 ±
2	Miscellaneous Headworks 1 Repairs	\$5.9 ±
3	Headworks 2 Modifications	\$62.6 ±
4	Headworks Odor Control	\$22.7 ±
5	Expand and Line Raw Equalization Basin to 10 MG	\$9.0 ±
6	Demo Headworks 1	\$11.5 ±
7	Refurbish/Demo P&E Building	\$11.3 ±
8	Consolidate Influent Piping	\$21.5 ±
Program Subtotal		\$151.2 ±
Primary Treatment Projects – Adopted FY 2013-2017 CIP budget: \$33.2 million		
9-10	East Primaries Steel Conversion, Coating Rehabilitation, Concrete Repair, and Seismic Modification for Odor Control	\$50.1 ±
11	Primary Treatment Odor Control	\$49.9 ±
12	Tunnel Rehabilitation: West Primaries	\$1.8 ±
13	Tunnel Rehabilitation: East Primaries	\$2.4 ±
14	Iron Salt Facilities	\$2.5 ±
15	Demo West Primaries	\$22.1 ±
16	Additional 12 MG PE Equalization Basin	\$21.6 ±
Program Subtotal		\$150.4 ±
Secondary Treatment Projects – Adopted FY 2013-2017 CIP budget: \$35.9 million		
17	Secondary Air Plenum Filtration	\$1.7±
18	Connect BNR1 and BNR2 Clarifiers	\$14.6 ±
19	Connect Aeration Headers	\$4.7 ±
20	Aeration Tank Rehabilitation (BNR 1 and BNR 2)	\$62.1 ±
21	Rehabilitation of Remaining Secondary Clarifiers (BNR 2)	\$13.2 ±
22	CFD Modeling and Rehabilitation of 1 Secondary Clarifier	\$1.2 ±
23	Rehabilitation of Remaining Secondary Clarifiers (BNR 1)	\$28.9 ±
24	Conversion to Fine Bubble Diffusers	\$35.4 ±

Secondary Treatment Projects – Adopted FY 2013-2017 CIP budget: \$35.9 million		
Draft PMP ID #	Project	Draft PMP Cost Estimate* (in millions)
25	Foam and Scum Control	\$1.4 ±
26	Nocardia Control	\$7.7 ±
27	Field Verification of Foam and Scum Control Options	\$1.1 ±
29	Conversion to NAS (TN < 8mg/L regulation) – Alternative 2	\$68.0 ±
28, 30	Other Alternatives	—
Program Subtotal		\$240.0 ±
Tertiary Treatment Projects – Adopted FY 2013-2017 CIP budget: \$2.8 million		
31	Underdrain and Media (Remaining Bank A7 filters)	\$3.2±
32	Miscellaneous Filtration Repairs	\$12.2 ±
33	Field Verification of Alternative Filter Technology	\$3.2 ±
34	Underdrain and Media (1 filter) + Field Verification	\$0.4 ±
35	New Filters: 128 mgd Tetra Denite plus 52 mgd New Tertiary (NAS mode only) – Alternative 1	\$132.6 ±
39	New Ultraviolet Disinfection Facilities – Alternative 3	\$49.4 ±
36-38, 40-41	Other Alternatives	—
		\$201.0 ±
Biosolids Digestion – Adopted FY 2013-2017 CIP budget: \$64.6 million		
44	WAS and Primary Sludge Fine Screening	11.8 ±
45	Digester Gas Manifold and Tunnel Improvements	\$14.7 ±
46	Tunnel Rehabilitation: Digesters and DAFT	6.8 ±
47-49	Digester Cover and Mixing Upgrades (4 digesters)	30.1 ±
50	Digester Cover and Mixing Upgrades (3 digesters)	26.0 ±
51	Digester Cover and Mixing Upgrades (3 digesters)	27.9 ±
52	DAFT Final Upgrades (6 DAFTs)	4.6 ±
53	Digester Heating Upgrades	0.7 ±
54	Struvite Control Chemical Feed	0.2 ±
55	Digestion Pre-Treatment Field Verification	11.4 ±
56	FOG Receiving Station and 1/2-Mile Access Road	9.2 ±
57	Fourteen-inch Digested Sludge Line Replacement (parallel pipe)	12.9 ±
Program Subtotal		\$156.3 ±

Biosolids Residual Sludge Management – Adopted FY 2013-2017 CIP budget: \$1.6 million		
Draft PMP ID #	Project	Draft PMP Cost Estimate* (in millions)
42	Inactive Lagoons Rehabilitation Phase 1	13.9 ±
43	Inactive Lagoons Rehabilitation Phase 2	13.9 ±
58	Sludge Dewatering Field Verification	2.3 ±
59	2/3 Full Mechanical Dewatering (Centrifuges) Plus Feed Storage Tank	84.7 ±
60	Cake Storage	15.1 ±
61	1/3 Full Mechanical Dewatering (Centrifuges)	41.9 ±
62	Lagoons/Drying Bed Retirement	3.0 ±
63	2/3 Covered Lagoons (180 days storage)	32.0 ±
64	Emergency Biosolids Storage	7.6 ±
65	1/3 Covered Lagoons (180 days storage)	19.8 ±
66	Sludge Drying Field Verification	1.8 ±
67	2/3 Thermal Drying for 20 Percent of Solids Stream	68.5 ±
68	1/3 Thermal Drying for 20 Percent of Solids Stream	27.7 ±
69	Biosolids Greenhouse Demonstration Project (w/ BFPs)	9.0 ±
70	2/3 Greenhouse: Full Scale (w/o dewatering)	13.3 ±
71	1/3 Greenhouse: Full Scale (w/o dewatering)	7.8 ±
Program Subtotal		362.3±
Power Generation – Adopted FY 2013-2017 CIP budget: \$4.6 million		
72	Energy Strategic Plan	0.4 ±
73	Fuel Cell	1.4 ±
74	Facility Electrical Reliability (PER) – 4.6 MW Gas Turbine Phase 1 (w/o gas storage)	36.0 ±
75	Gas Turbine Phase 2 (9.2 MW) (2 turbines)	39.0 ±
76	Gas Turbine Phase 3 (4.6 MW)	23.7 ±
77	Digester Gas Storage, Compressors, and Piping	15.3 ±
78	Solar Power Facility Phase 1 (1 MW) – PPA	0.8 ±
79	Solar Power Facility Phase 1 (1 MW) – Direct Purchase	7.3 ±
80	Solar Power Facility Phase 2 (5 MW)	42.3 ±
Program Subtotal		\$166.2 ±

Electrical Systems – Adopted FY 2013-2017 CIP budget: \$3.0 million		
Draft PMP ID #	Project	Draft PMP Cost Estimate* (in millions)
81	PER – 115 kV Breaker Replacement	2.9 ±
82	PER – M1, M2, M3 Switchgear Replacement	0.5 ±
83	PER – MCC H1, H2, J1, J2	0.2 ±
84	PER – MCC Phase II Replacements	0.3 ±
85	PER – S11 Switchgear Replacement	9.9 ±
86	PER – S40 and G3 Switchgear Update	14.2 ±
87	PER – Standby Generator (Admin Building)	0.6 ±
88	Double-ended Substation with Switchgear for Solids Handling Processes	4.0 ±
Program Subtotal		\$32.6 ±
Advanced Process Control Systems Projects – Adopted FY 2013-2017 CIP budget: \$6.5 million		
89-91	Advanced Process Control and Automation	9.6 ±
92	EG2 and EG3 Engine Control Panel Upgrade	0.2 ±
93	Side Stream Nitrogen Removal	—
Program Subtotal		\$9.8 ±
Site Facility Improvements – Adopted FY 2013-2017 CIP budget: \$32.3 million		
94-96	Miscellaneous Heating and Cooling Upgrades	3.0 ±
97	Handrail Replacement	5.0 ±
98	Site Facility Improvements – Phase 1 (through 2025)	9.1 ±
99	Site Facility Improvements – Phase 2 (2026 through 2040)	12.2 ±
100	Yard Piping	16.5 ±
101	Unanticipated/Critical Repairs	25.4 ±
102	Unspecified Remaining Repair and Rehabilitation (2025 through 2040)	416.0 ±
103-104	Tunnel Rehabilitation: BNR 1 and BNR 2	10.3 ±
105	3W Pump Station Improvements	1.1 ±
106-109	Warehousing Facility Additions and Support Building Improvements	100.9 ±
110-112	Public Art Reserve – 2010 to 2040	TBD
Program Subtotal		\$599.5 ±

\* Cost estimates follow the American Associate of Cost Engineering International (AACE International) Recommended Practice No. 18R-97 estimate classes 5 and 4. Typical accuracy range for Class 5 estimates are -20 percent to -50 percent on the low side, and +30 percent to +100 percent on the high side. Class 4 estimates are -15 percent to -30 percent on the low side, and +20 percent to +50 percent on the high side. Cost estimates for engineering, construction, and contingencies are escalated to the midpoint construction at 2 percent per annum.